

Appl. No.: 10/028,556
Amdt. dated February 25, 2005
Reply to Office Action of December 8, 2004

REMARKS/ARGUMENTS

In the Non-final Office Action mailed December 9, 2004, claims 1-6 and 11-13 were examined, and claims 7-10 were withdrawn from consideration. In the Office Action, the Examiner rejected, and objected to, the claims as follows:

- Claim 4 was rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite, and was objected to as allegedly having improper dependent form.
- Claims 1, 2, 11, and 12 were rejected under 35 U.S.C. § 103(a), as allegedly obvious over U.S. Patent No. 6,148,399 to Lyke ("the Lyke patent") in view of U.S. Patent No. 5,892,962 to Cloutier ("the Cloutier patent") and U.S. Patent Application Publication No. 2002/0129191 to DaCosta ("the DaCosta publication").
- Claims 3, 5, 6, and 13 were objected to as being dependent upon a rejected base claim, but indicated to be allowable if rewritten in independent form.

Applicant has cancelled rejected claims 1, 4, and 7-11, has amended allowable claims 3, 5, 6, and 13 to be in independent form, and has amended dependent claims 2 and 12 to depend from allowable claims 6 and 13, respectively. Applicant has added new claims 14-27. Accordingly, Applicant respectfully requests the removal the objections, and traverses the rejection to dependent claims 2 and 12.

The Invention

Before addressing the specific claim limitations, it will be helpful first to briefly summarize embodiments of the invention that are covered by the pending claims.

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The present invention resides in a new and improved stand-alone, compact, low-power electronic instrument controller. The core elements of the present invention include the following: a microprocessor, a static random access memory, a non-volatile memory, a dynamically reconfigurable field programmable gate array (FPGA), reconfigurable interconnect devices, analog function blocks, and embedded power conversion. Preferably, the present invention supports the following: multiple analog inputs, with at least four analog inputs to a high precision digitizer, analog outputs, adjustable analog signal paths, serial communications ports, interrupts, and digital discrete I/O.

In a preferred embodiment, the present invention supports the following types of functionality: (1) in-situ reprogramming of the microprocessor's operational software; (2) in-situ reprogramming of the FPGA's operational software programs, with adaptive parallel program codes; (3) individualization of the serial codes, embedded descriptions of design specification, past history, maintenance, etc.; (4) storage of configuration information for setting properties of functional units; (5) a real-time crystal oscillator controlled clock; and (6) creative power management options for discontinuous (going from powered operation to non-powered) operation effected through state preservation and recovery.

The instrument controller of the present invention offers enhanced power management and functional flexibility, more specifically, the instrument controller offers variable analog-to-digital conversion bit depths, along with higher bit depths for some applications. Also, the present invention eliminates the need for a resistive ASIC. Instead, the present invention adds a separately controllable FPGA that acts as a parallel processor with an internal clock or separate external clock. The FPGA preferably includes more than thirty thousand gates and adds a freely reconfigurable, and separately programmable, multi-purpose digital system that can run independent of the microprocessor. Also, the present invention incorporates a microprocessor with a processing speed of up to 33 MHz.

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The Election of Claims 1-6 and 11-13

On page 2 of the Office Action, the Examiner requested affirmation of the provisional election of claims 1-6 and 11-13. Applicant affirms the election with traverse to prosecute the invention of claims 1-6 and 11-13.

The Rejection of Claim 4 Under 35 U.S.C. § 112, Second Paragraph

On page 3 of the Office Action, dependent claim 4 was rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Also, on page 6 of the Office Action, dependent claim 4 was objected to, as allegedly being of improper dependent form. Applicant has canceled dependent claim 4, and, as such, Applicant believes the rejection of, and objection to, dependent claim 4 are moot.

The Rejection of Claims 1, 2, 11, and 12 Based on the Lyke Patent, the Clotier Patent, and the DaCosta Publication

On pages 3-6 of the Office Action, independent claims 1 and 11, and dependent claims 2 and 12, were rejected under 35 U.S.C. § 103(a), as allegedly obvious over the Lyke patent in view of the Clotier patent and the DaCosta publication. Applicant has canceled independent claims 1 and 11, and amended claims 2 and 12 to depend from allowable claims 6 and 13, respectively. Thus, Applicant believes this rejection to claims 1, 2, 11, and 12 is moot.

Allowable Subject Matter

On page 7 of the Office Action, the Examiner indicated that dependent claims 3, 5, 6, and 13 "would be allowable if rewritten in independent form . . ." Applicant has amended dependent claims 3, 5, 6, and 13 so as to be written in independent form. Accordingly, Applicant believes amended independent claims 3, 5, 6, and 13 to be allowable, and respectfully requests removal of this objection.

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New Claims 14-27

Applicant has added new claims 14-27 to offer additional permutations of patent protection. As previously noted, support for new dependent claims 14, 15, 18, 21, and 25 is found, *inter alia*, in originally filed independent claim 7. Support for new dependent claims 16 and 19 is found, *inter alia*, in originally filed dependent claim 2. Support for new dependent claims 17 and 20 is found, *inter alia*, in originally filed dependent claim 10. Support for new independent claim 22 is found, *inter alia*, in originally filed claims 1, 2, 3, and 6, and in the specification on page 15, lines 9-11, page 18, lines 9-12, and page 21, lines 15-17. Support for new claims 23, 24, and 27 is found, *inter alia*, in originally filed dependent claims 5, 6, and 13, respectively. Support for new dependent claim 26 is found, *inter alia*, in originally filed dependent claim 8. No new matter has been added.

Applicant believes that new dependent claims 14-21 are allowable because each of those claims depends from allowable amended independent claim 3, 5, or 6. Also, Applicant believes that new independent claim 22 and new dependent claims 23-26, all of which depend from independent claim 22, are allowable because they include the following claim features: "a first portion of the gates in the field programmable gate array is configured to perform signal processing, a second portion of the gates in the field programmable gate array is configured to operate as a signal distribution matrix, and a third portion of the gates in the field programmable gate array is configured to operate as an internal embedded power converter . . .," which the Examiner, on page 7 of the Office Action, stated were reasons for the allowability of claims 3, 6, and 13. Similarly, Applicant believes that new independent claim 27 is allowable because it includes the following claim features: "configuring a portion of the gates in the field programmable gate array to operate as an internal embedded power converter . . .," which the Examiner, on page 7 of the Office Action, stated was a reason for the allowability of claims 6 and 13.

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Conclusion

This application should now be in condition for a favorable action. Applicant respectfully requests entry of the Amendment and an early allowance of all claims herein. If for any reason the Examiner finds the application other than in allowance, the Examiner is requested to call the undersigned attorney at the below-listed telephone number to discuss the steps necessary for placing the application in condition for allowance. If there are any fees due in connection with the filing of this Amendment, please charge the fees to our Deposit Account No. 19-1853.

Respectfully submitted,
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